

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

# PCT

To:

BAKER BOTTS L.L.P.  
Attn. Abelev, Gary  
30 Rockefeller Plaza  
New York, NY 10112-4498  
UNITED STATES OF AMERICA

Patent Mail Received

MAR 30 2005

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION

BAKER BOTTS, L.L.P.

05 MAR 21 AM 10:02

(PCT Rule 44.1)

Date of mailing  
(day/month/year)

14/03/2005

Applicant's or agent's file reference

036234/PCT - 475387-33

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/US2004/018045

International filing date  
(day/month/year)

04/06/2004

Applicant

THE GENERAL HOSPITAL CORPORATION

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

## Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.  
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

## 4. Reminders

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until **30 months** from the priority date (in some Offices even later); otherwise, the applicant must, within **20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Ka-Bo Chan

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

**The amendments must be made in the language in which the international application is to be published.**

#### What documents must/may accompany the amendments?

##### Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

**The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.**

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 36234 - PCT	<b>FOR FURTHER ACTION</b>		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2004/018045	International filing date (day/month/year) 04/06/2004	(Earliest) Priority Date (day/month/year) 06/06/2003	
Applicant  THE GENERAL HOSPITAL CORPORATION			

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 7 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box II).

3. ☒ **Unity of invention is lacking** (see Box III).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1b



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

- b. ☐ none of the figures is to be published with the abstract.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2004/018045**Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

**Remark on Protest**

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

## 1. claims: 1-7,9-16

an apparatus for filtering electromagnetic radiation having a plurality of beam selecting elements.  
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## 2. claim: 17

an apparatus for filtering electromagnetic radiation wherein the signal is reflected from the rotating optical arrangement a plurality of times.  
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## 3. claims: 18-25

an apparatus for filtering electromagnetic radiation wherein the pivot point of the rotating arrangement has specific properties.  
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## 4. claims: 8,26-43

a source of light, in particular a laser gain medium  
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## 5. claims: 44-51

an apparatus comprising first and second arrangements for providing first and second radiation as well as means for detecting interference.  
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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01J3/18 H01S3/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01J H01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/054027 A (CORETEK INC) 11 July 2002 (2002-07-11) abstract; figure 1	1-7,9-15
Y	-----	16
X	US 2 339 754 A (BRACE PORTER H) 25 January 1944 (1944-01-25) page 2, column 2, line 8 - line 44; figure 2	1-7,9-15
Y	-----	16
Y	US 4 993 834 A (CARLHOFF CHRISTOPH ET AL) 19 February 1991 (1991-02-19) abstract; figure 1	16
A	-----	16
	EP 0 110 201 A (KOEZPONTI ELELMISZERIPARI) 13 June 1984 (1984-06-13) abstract; figure 1	
	-----	

-/-

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

\* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the international search

4 March 2005

Date of mailing of the international search report

14. 03. 2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Schmidt, C.

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
✓ A	US 5 040 889 A (KEANE THOMAS J) 20 August 1991 (1991-08-20) abstract; figure 1	16
✓ X	US 4 601 036 A (FAXWOG, MOCKER) 15 July 1986 (1986-07-15)  column 5, line 56 - column 6, line 5; figure 5	8, 17, 18, 21-24, 26-31, 33, 34, 36-38, 40, 41, 43
Y		32, 35, 39, 42 19, 20, 25
A		
✓ X	US 4 868 834 A (FOX, AHL) 19 September 1989 (1989-09-19)  column 1, line 65 - column 2, line 68; figure 1	8, 17, 18, 21-24, 26-31, 33, 34, 36-38, 40, 41, 43
Y		32, 35, 39, 42 19, 20, 25
A		
✓ Y	WO 98/35203 A (SWANSON) 13 August 1998 (1998-08-13) page 16, line 4 - line 15; figure 4 page 18, line 13 - line 21; figure 6 page 10, line 1 - line 3 page 16, line 14 - page 17, line 6; figures 4-6	32, 35, 39, 42
X		18, 21-24, 44-51 19, 20, 25
A		
A	US 5 975 697 A (PODOLEANU, JACKSON) 2 November 1999 (1999-11-02) column 3, line 43 - column 4, line 2; figures 1, 5, 7 column 5, line 62 - column 6, line 6	44-51
A	US 5 459 570 A (SWANSON, HUANG ET AL) 17 October 1995 (1995-10-17) abstract; figure 1	44-51
A	US 6 341 036 B1 (TEARNEY, BOUMA, WEBB) 22 January 2002 (2002-01-22) abstract; figures 3-5	44-51

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 02054027	A	11-07-2002	US 2002191194 A1 CA 2436729 A1 EP 1356256 A1 WO 02054027 A1 US 2003174327 A1	19-12-2002 11-07-2002 29-10-2003 11-07-2002 18-09-2003
US 2339754	A	25-01-1944	US 2406318 A	27-08-1946
US 4993834	A	19-02-1991	DE 3833602 A1 CA 1329019 C EP 0362562 A2 ES 2047076 T3 JP 2147926 A	15-02-1990 03-05-1994 11-04-1990 16-02-1994 06-06-1990
EP 0110201	A	13-06-1984	HU 187188 B EP 0110201 A2	28-11-1985 13-06-1984
US 5040889	A	20-08-1991	NONE	
US 4601036	A	15-07-1986	CA 1223949 A1 DE 3335317 A1 GB 2129201 A JP 1036987 B JP 1551508 C JP 59084487 A	07-07-1987 05-04-1984 10-05-1984 03-08-1989 23-03-1990 16-05-1984
US 4868834	A	19-09-1989	NONE	
WO 9835203	A	13-08-1998	US 5956355 A WO 9835203 A2 US 6160826 A	21-09-1999 13-08-1998 12-12-2000
US 5975697	A	02-11-1999	NONE	
US 5459570	A	17-10-1995	US 6485413 B1 US 6111645 A US 6160826 A US 6564087 B1 US 6501551 B1 US 6282011 B1 US 6134003 A US 5956355 A US 2001036002 A1 DE 69227902 D1 DE 69227902 T2 EP 0581871 A1 JP 3479069 B2 JP 6511312 T JP 2004105708 A WO 9219930 A1 US 5465147 A US 5321501 A	26-11-2002 29-08-2000 12-12-2000 13-05-2003 31-12-2002 28-08-2001 17-10-2000 21-09-1999 01-11-2001 28-01-1999 17-06-1999 09-02-1994 15-12-2003 15-12-1994 08-04-2004 12-11-1992 07-11-1995 14-06-1994
US 6341036	B1	22-01-2002	US 2002122246 A1 AU 758078 B2 AU 2882399 A EP 1057063 A1 JP 2002505434 T	05-09-2002 13-03-2003 15-09-1999 06-12-2000 19-02-2002



Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6341036	B1	WO 9944089 A1	02-09-1999

## Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

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### General information

For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.

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### Amending claims under Art. 19 PCT

Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file **amended claims** under Art. 19 PCT **directly with the International Bureau of WIPO**. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.

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### Filing a demand for international preliminary examination

In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of **3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later** (Rule 54*bis* PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1(b) PCT).

If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability).

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### Filing informal comments (written observations under Rule 44*bis* PCT)

After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA **directly with the International Bureau of WIPO**. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.

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### End of the international phase

At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPER (international preliminary examination report).

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### Relevant PCT Rules + more INFO

Rule 43 PCT, Rule 43*bis* PCT, Rule 44 PCT, Rule 44*bis* PCT, PCT newsletter 12/2003, OJ 11/2003, OJ 12/2003

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:  
  
see form PCT/ISA/220

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2004/018045

International filing date (day/month/year)  
04.06.2004

Priority date (day/month/year)  
06.06.2003

International Patent Classification (IPC) or both national classification and IPC  
G01J3/18, H01S3/10

Applicant  
THE GENERAL HOSPITAL CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion  
☐ Box No. II Priority  
☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  
☒ Box No. IV Lack of unity of invention  
☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement  
☐ Box No. VI Certain documents cited  
☐ Box No. VII Certain defects in the international application  
☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b(s) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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D-80298 Munich  
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Authorized Officer

Schmidt, C.

Telephone No. +49 89 2399-2254



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**Box No. I    Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material:  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing:  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 1-7(in part), 9-10(in part)

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the whole application or for said claims Nos. 1-7(in part), 9-10(in part)
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
  - the written form ☐ has not been furnished
  - ☐ does not comply with the standard
  - the computer readable form ☐ has not been furnished
  - ☐ does not comply with the standard
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.
- ☐ See separate sheet for further details

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**Box No. IV Lack of unity of invention**

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1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:
- ☒ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☐ not paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
  - ☒ not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☒ all parts.
  - ☐ the parts relating to claims Nos.

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	14,16,19,20,25,32,35,39,42
	No: Claims	1-7(in part),8,9-10(in part), 11-13,15,17,18, 21-24,26-31,33,34,36-38,40,41,43-51
Inventive step (IS)	Yes: Claims	19, 20, 25
	No: Claims	1-7(in part),9-10(in part), 11-51
Industrial applicability (IA)	Yes: Claims	1-51
	No: Claims	

2. Citations and explanations

**see separate sheet**

### **Section III**

Claims 1-10 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempt to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

For the purposes of the search and examination these claims have been interpreted as comprising the features of claim 11, which according to the description seems to be the features which can enable the desired result.

### **Section IV**

This Authority considers that there are 5 inventions covered by the claims indicated as follows:

- 1: Claims 1-7,9-16** directed to an apparatus for filtering electromagnetic radiation having a plurality of beam selecting elements.
- 2: Claim 17** directed to an apparatus for filtering electromagnetic radiation wherein the signal is reflected from the rotating optical arrangement a plurality of times.
- 3: Claims 18-25** directed to an apparatus for filtering electromagnetic radiation wherein the pivot point of the rotating arrangement has specific properties.
- 4: Claims 8, 26-43** directed to a source of light, in particular a laser gain medium.
- 5: Claims 44-51** directed to an apparatus comprising first and second arrangements for providing first and second radiation as well as means for detecting interference.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The present application contains 12 independent claims. The common concept linking these claims are the features of independent claim 11. (It should be noted that due to severe lack of clarity (Article 6 PCT) in claims 1-10 due to a definition by result to be achieved only, these claims have been interpreted in accordance with the description to

encompass the features of claim 11.)

However, this common concept, ie the features of claim 11, is already known from document D1=WO 02054027 A which discloses:

An apparatus for filtering an electromagnetic radiation, comprising (see Abstract and figure 1):

- at least one spectral separating arrangement configured to physically separate one or more components of the electromagnetic radiation based on a frequency of the radiation (optical grating 110);
- at least one continuously rotating optical arrangement which is configured to receive at least one signal that is associated with the one or more components (rotating polygon 115); and
- at least one beam selecting arrangement configured to receive the at least one signal (aperture 135).

It follows that the further independent claims as well as claims 16 and 17 depending on claim 11 define different inventions having different special technical features within the meaning of Rule 13.2 PCT as defined above.

The problem to be solved by these special technical features can be construed as:

**Claim 16:** to provide for multiple selection of spectral components, for example to enable multiple band detection or multiple band illumination.

**Claim 17:** to increase speed by reflecting a plurality of times.

**Claims 18-25:** to optimise the optical properties of the system with respect to the pivot point of the rotating mirror.

**Claims 8, 26-43:** to provide a source of light, in particular a laser gain medium, having fast tuning.

**Claims 44-51:** to provide an interference system with a reference light source and a sample light source.

Further, also examining the possible correspondence by technical effect, it follows immediately from the above stated that the technical effects of the different groups do not correspond.



Consequently, neither the objective problem underlying the subjects of the claimed inventions, nor their solutions defined by the special technical features allow for a relationship to be established between the said inventions, which involves a single general inventive concept.

In conclusion, the groups of claims are not linked by common or corresponding special technical features and define different inventions not linked by a single general inventive concept.

The application, hence does not meet the requirements of unity of invention as defined in Rules 13.1 and 13.2 PCT.

## **Section V**

### **Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

#### **Cited documents:**

D1: WO A 02 054027

D2: US A 2 339 754

D3: US A 4 993 834

D4: EP A 0 110 201

D5: US A 5 040 889

#### **1. First group: claims 1-7,9-16**

- 1.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of 11 is not new in the sense of Article 33(2) PCT.

As discussed above under Section IV, document D1 discloses an apparatus having all the features of present claim 11.

It should be noted that the same objection can be raised in view of document D2: see figure 2 and page 2, right hand column, lines 8 to 44.

- 1.2 Independent claim 1 as well as dependent claims 2-7,9,10 and 12 to 16 do not contain any features which, if applicable in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step:

**Claims 1 to 7:** as far as these claims are interpreted in the light of the description (see Section III) it would appear that since the constructional features of D1 are the same as those of the present application, the parameter values indicated as a result to be achieved are also implicit in D1. With respect to the wavelength ranges claimed, these fall within the normal range for such filters (D1: page 6, l. 8).

**Claims 9 and 10:** these features are already known from D1 and D2, see above.

**Claims 12 to 15:** these claim define only minor constructional features which are well known from eg D1 and/or D2 or which are well known equivalents.

**Claim 16:** the feature of providing multiple beam selecting elements, such as apertures, is considered obvious for the skilled person. As can be seen from eg D3 it is well known in the art to provide for a multi slit detection arrangement. It would thus be obvious for the skilled person to include multiple slits or other beam selecting elements if a plurality of beams are to be used simultaneously. It is obvious that these plural beams may then be combined if this is desired.

## **2. Second group: claim 17**

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 17 is not new in the sense of Article 33(2) PCT.

Document D6 discloses an apparatus for filtering an electromagnetic radiation, comprising (see Abstract and figure 5):

- at least one spectral separating arrangement configured to physically separate one or more components of the electromagnetic radiation based on a frequency of the radiation (optical grating 76);
- at least one continuously rotating optical arrangement which is configured to receive

at least one signal that is associated with the one or more components (rotating polygon 74); and

- at least one beam selecting arrangement configured to receive the at least one signal (output of laser beam via reflecting means 16); wherein
- the signal is reflected from or propagates through the rotating optical arrangement a plurality of times before being received by the beam selecting arrangement (see figure; the beam is reflected on the polygonal mirror on the way to the grating and on the way back; further due to the in cavity arrangement it also propagates back and forth a number of times).

Thus, D6 discloses an arrangement having all the features of claim 17.

2.2 The same objection can also be raised over document D7 (see figure 1).

### **3. Third group: claims 18-25**

3.1 Document D8 describes an apparatus for filtering an electromagnetic radiation comprising:

- at least one spectral separating arrangement for angular separation of frequencies of the radiation (Figure 1: grating 70);
- an optical deflecting arrangement that includes a pivot point (mirror 66 which is pivoted around a pivot point as indicated in the figure);
- an optical imaging arrangement generating an image of the dispersive element (lens 62); and
- a beam selecting arrangement (eg chip 58).

Thus, D8 discloses an arrangement comprising all the features of present claim 18.

Reference is also made to the above discussed documents w.r.t. the rotating polygon filter arrangement, which all have a pivot point and for which imaging optics may be used.

### **3.2 Claims 19, 20 and 25**

No objection under novelty and inventive step is raised for these claims. The cited prior art does not disclose an arrangement wherein the pivot point is in a proximity

of a virtual or real image of at least one of the dispersive elements.

**3.3 Claims 21-24**

Also in the prior art the deflecting point overlaps with a real image of the dispersive element. Further, also in the prior art at least one reflector in the broad definition of this claim receives a signal from the deflecting mirror.

The elements cited in claims 23 and 24 are partly known from the prior art (grating, prism, polygon mirror, mirror scanners) or otherwise obvious equivalents.

**4. Fourth group: claims 8, 26-43**

As detailed above under 2.1 and 2.2, documents D6 and D7 disclose arrangements with a laser cavity. Thus, it follows that independent claims 26, 27, 28, 30 and 37 are not novel over that prior art. This also holds for the dependent claims 8, 27, 29, 31, 33, 38 and 40.

With respect to dependent claims 36 and 43 it is noted that D6 clearly states the use of different wavelength bands (see eg figure 6, column 5, line 67 to column 6, line 5).

Regarding dependent claims 32, 35, 39 and 42 it is noted that the use of ring laser cavities or optical circulators are well known in the art. Document D8 gives in figure 4 an example of a circulator (204) and in figure 6 an example of an embodiment with a ring laser. Further, the applicant's attention is drawn to page 10, first 3 lines which state that "rotating polygons...may be used with frequency dispersive elements to achieve high scanning rates".

**5. Fifth group: claims 44-51**

These claims are not novel over document D8.

D8 discloses an apparatus comprising (see figure 1 and page 3, line 10 to page 4, line 2):

- a first arrangement (tunable laser 14) providing one first radiation to a sample (the optical path leading to sample 38) and a second radiation to a reference (optical path leading to reference mirror 34); wherein a frequency of radiation provided by the first arrangement varies over time (frequency tuned laser 14);
- at least one second arrangement detecting an interference between the first and second electromagnetic radiations (interferometer 18);
- at least one spectral separating arrangement (wavelength selective element 70);
- at least one continuously rotating optical arrangement having a pivot point (steerable mirror 66);
- at least one beam selecting arrangement (eg the output aperture of the laser).

Thus, D8 discloses an apparatus having all the features of independent claim 44.

With respect to dependent claims 45, 47, 49 and 51 it is noted that in D8, page 16, last line to page 17 first 6 lines it is clearly stated that the reference reflection can be made as small as possible.

With respect to independent claim 46 it is noted that D8 also discloses the additional features of the apparatus comprising an optical imaging arrangement (detector 50 being a one or two-dimensional array which captures two-dimensional images; page 17, lines 14-16).

With respect to independent claim 48 it is noted that D8 discloses a laser gain arrangement (tunable laser 14).

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/US2004/018045